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way represented a federal, state or municipal organization.

Mr. Halsey refers to a report issued in October, 1921, as confirmation of all his contentions. It is amusing to find that this report was drawn up under the guidance of a committee of five men: the gage manufacturer referred to above, two others associated with him in his fight to kill the metric system, and an impotent minority of two good metric advocates.

However, the use of metric weights and measures, legal for all transactions in the United States since July 28, 1866, is above personalities. As a nation we find ourselves to-day endeavoring to bring about mutual understanding and world-wide trade. At least 46 countries have officially adopted the metric system for general use. Partly through the excellent work of the Decimal Association of London, England has already left America behind in the use of metric weights and measures.

The hearings are over on the Britten-Ladd Bill. The campaign to put this bill, or a modified form of it, through Congress is before our association. At the same time we are co-operating with the Toronto and other sections of the American Metric Association, and an ever increasing number of men and women in North America are using metric weights and measures. We ask for the cooperation of all in the United States and Canada.

HOWARD RICHARDS,

Secretary,

American Metric Association

APRIL 25, 1922

SCIENTIFIC BOOKS
THE BIOLOGICAL RESEARCHES OF
GUSTAF RETZIUS

VOLUME XIX, *Neue Folge*, of the *Biologische Untersuchungen* of Gustaf Retzius completes the scientific works of the great anatomist and anthropologist who died in the summer of 1919.

This posthumous volume has been edited and compiled at the request of Madame Retzius by Professor Carl Furst, of the University of Lund. Professor Furst is the oldest living

friend and colleague of Retzius, and was well equipped, both by virtue of long acquaintance and collaboration with the author, and by familiarity with his work, to edit for publication the series of technical papers which comprise the volume. These papers are seven in number, and are accompanied by twenty-one beautiful plates of folio size.

The first contribution, under the title, "Weitere Beiträge zur Kenntnis von dem Bau und der Anordnung des Ependyms und der sämtlichen Neuroglia, besonders bei den niederen Vertebraten" (Taf. I-XVI), describes the neuroglia and ependyma of various vertebrates in four sections, viz.: A. *Amphioxus*; B. *Myxine*; C. *Petromyzon*; and D. *Selachians, Teleosts, Amphibia, Birds and Mammals*. The text of section D has been inserted by the editor from a translation into German of an article originally published elsewhere by Retzius in Swedish. The editor states: "Wir bekommen dadurch von Retzius selbst eine Erklärung einiger wichtiger, hier mitgeteilten Figuren. Gustaf Retzius hat mehrmals frühere Arbeiten, die in schwedischer Sprache herausgegeben waren, später in Biol. Unter. in deutscher Übersetzung aufgenommen. Wenn ich diese Abhandlung aus der Müllerschen Festschrift einsetze lasse ich doch grossteils die historische Einleitung der Abhandlung aus. Der Inhalt dieses Historik ist nämlich in den hier oben mitgeteilten Abhandlung ausführlichen mitgeteilt."

The second paper, "Einige Beiträge zur Kenntnis der Structur der Ependym— und Nervenzellen im Rückenmark der Cyclostomen" (Taf. XVII, Fig. 1-24), describes a type of cell among the ependyma cells of the spinal cord of cyclostomes which has been called "inneren Sinneszellen" by several investigators, but which Retzius concludes are modified ependyma cells. The second part of this article considers the fibrillar structure of nerve cells of the spinal cord in this lowly group of vertebrates.

Nine of the folio pages and one plate (Taf. XVIII) describe certain phases of the structure of the lens of the eye, under the title "Zur Kenntnis des Baus des Glaskörpers im Auge des Menschen."

In the fourth and fifth articles (Taf. XIX-XXI) the author continues his already extensive studies on the spermatozoa of various animal groups, under the titles "Die Spermien der Cyclostomen" and "Noch einige Beiträge zur Kenntnis der Spermien bei den Affen," respectively.

"Die Gehirne der Affengattungen *Cebus* und *Atelles*" is without figures. It consists of some notes which supplement the author's earlier work, "Das Affenhirn in bildlicher Darstellung," in which figures of these brains are found.

The final contribution "Die Verbindungen zwischen dem Sarcolemma und den Grundmembranen der Muskelfibrillen in bildlicher Darstellung" (Taf. XVII, Fig. 25-27) is made up of three figures which represent the striated muscle of salamander larvæ, showing the finer structure of the muscle fibers and the relation of the ground membrane to the myofibrillæ and to the sarcolemma. Apparently a paper on this subject was contemplated by Retzius, but the text was not written. The editor refrains from supplying it, stating "Die Bilder demonstrieren selbst so gut diese Verhältnisse dass eine eingehende Erklärung nicht nötig ist. Prinzipiell will ich hier nicht versuchen, Wörter, die Retzius nicht selbst niedergeschrieben hat, ihm in den Mund zu legen." This statement admirably summarizes the attitude of the editor toward the contents of the entire volume.

The volume closes with an excellent table of contents of the two series of the *Biologische Untersuchungen*, namely, the two volumes which appeared in 1881 and 1882, and the nineteen volumes of the *Neue Folge*. Following this is a bibliography of the scientific works of Retzius, arranged by subjects. This bibliography consists of 333 titles.

It is fitting that the dedicatory page which in the preceding volumes has borne the names of so many distinguished anatomists should bear in the last volume the inscription by the widow of the author:

Dem Andenken meines verewigten Gemahls
GUSTAF RETZIUS
in Liebe und Dankbarkeit gewidmet.
Anna Hierta-Retzius.

To the sympathetic cooperation of his wife is due in no small measure, together with his own untiring zeal, the unique monument which Retzius has left in the nineteen folio volumes of the *Biologische Untersuchungen*, and the numerous other papers and monographs which bear his name.

O. LARSELL

UNIVERSITY OF OREGON
MEDICAL SCHOOL

SPECIAL ARTICLES

POLYPLOIDY, POLYSPORY, AND HYBRIDISM IN THE ANGIOSPERMS

FOR some time investigations have been carried on in these laboratories on the subject of polyploidy in relation to polyspory and hybridism. The material used consists of both Dicotyledons and Monocotyledons, and represents either known hybrids or species belonging to genera or groups in which a great deal of natural hybridism is suspected. The conclusion has been reached that polyploidy is a common result of incompatible species crosses. The normal gametophytic number of chromosomes becomes multiplied by three, four, etc., as a consequence of such inharmonious crosses, in various degrees of complexity. A frequent, although not invariable accompanying feature of polyploidy is the phenomenon of polyspory.

As is well known, the normal divisions taking place in the spore-mother cells of the Angiosperms, lead to the formation of four spores. Some of the members of the normal tetrad of spores may exceptionally abort, as for example, in the microspores of certain sedges. This condition of abortion is the normal one in the formation of megasporangia. In the case of polyspory the first division of the spore-mother cell leads to the formation of more than the two normal daughter nuclei. Two larger nuclei are generally formed by the union of certain of the chromosomes which undergo separation into daughter groups at a moment preceding that in which the remaining chromosomes pass into the metakinetie phase. The later dividing chromosomes, in separating tardily into daughter groups are ordinarily